UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,586	11/08/2001	Andrew Sendonaris	010496	4361

23696 7590 03/10/2005

Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER	
FILE, ERIN M	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,586	SENDONARIS, ANDREW	
	Examiner	Art Unit	
	Erin M. File	2634	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,16-19,24 and 27-30* is/are rejected.

7)☒ Claim(s) *13-15,20-23,25 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/10/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-12, 16, 19, 24, and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ling.

Claim 1, The claims set forth in the application are directed to pilot symbols and non-pilot symbols. Ling fails to disclose the use of pilot signals, however Ling does disclose the use of reference signals and data signals. Reference symbols are functionally equivalent to pilot symbols as they are both extra symbols inserted into a transmitted data in order to estimate channel interference and gain synchronization information. Data signals are a type of non-pilot symbols as is disclosed in the applicants' summary (Sedonaris, summary). Ling discloses accumulating reference symbols of a first wireless signal (fig. 5, 244, 246, 248, 250) and accumulating data symbols of the first wireless signal (fig. 5, 228, 230, 232, 234) and calculating a sum (fig. 5, 242) of the weighted accumulated reference symbols (fig. 5, 254) and the weighted accumulated data symbols (fig. 5, 236) to estimate power of the first wireless signal (col. 13, lines 45-55). Ling fails to disclose accumulating reference symbols, however, as Ling does discloses accumulating reference symbols. Ling uses these reference symbols for

estimating and controlling the power of a received symbol. Because reference symbols and reference symbols serve a similar purpose, it would be obvious to one skilled in the art at the time of invention to use reference symbols as reference symbols in Ling's teaching.

Claim 2, inherits the limitations of Claim 1, Ling further discloses accumulating reference symbols comprises coherently accumulating reference symbols by summing (228) each of the reference symbols and squaring the sum (232) of the reference symbols (col. 13, lines 45-55).

Claim 3, inherits the limitations of Claim 2. Ling further discloses accumulating the non-reference symbols by non-coherently accumulating a number of data symbols by squaring (fig. 5, 244) each of the number of data symbols and summing (fig. 5, 282) the squares of the data symbols (col. 13, lines 45-55).

Claim 4, inherits the limitations of Claim 1. Ling further discloses accumulating the data symbols by non-coherently accumulating a number of data symbols by squaring (fig. 5, 244) each of the number of data symbols and summing (fig. 5, 282) the squares of the data symbols (col. 13, lines 45-55).

Claim 5, inherits the limitations of Claim 1. Ling further discloses that the output of the power estimator (fig. 1, 146, fig. 5) is input to a comparator (fig. 1, 169) that compares

the power estimate to a determined threshold value which sets the power control indicator (fig. 1, 171, col. 9, lines 59-62, col. 10, lines 4-15).

Claim 6, inherits the limitations of Claim 5. Ling further discloses that the power control indicator (fig. 1, 180) is transmitted by and received by another communication unit in the wireless communication system which uses the power control indicator to adjust the transmitting power of that unit (col. 10, lines 11-38).

Claim 7, inherits the limitations of Claim 5. Ling further discloses that the power control indicator (fig. 1, 180) can be used to control the transmission power of a base station (col. 10, lines 11-38).

Claim 8, inherits the limitations of Claim 5. Ling further discloses that the power control signal as described in Claim 6 can be transmitted (fig. 1, 174) on a second wireless signal (col. 10, lines 11-38).

Claim 9, inherits the limitations of Claim 5. Ling further discloses that the power control signal as described in Claim 6 can be transmitted (fig. 1, 174) on a second wireless signal (col. 10, lines 11-38).

Claim 10, inherits the limitations of Claim 1. Ling further discloses determining a weight factor (fig. 5, 252) and calculating the weighted sum by summing (242) the accumulated

reference symbols with a result of the weight factor (252) multiplied by the accumulated data symbols (254, col. 13, lines 49-55).

Claim 11, inherits the limitations of Claim 1. Ling further discloses determining the weight factor comprises multiplying (238) a number of reference symbols in the accumulated reference symbols by a constant (236, col. 13, lines 49-55).

Claim 12, inherits the limitations of Claim 11, further Ling discloses the weighting coefficient of 1/3 for the reference signal and 2/3 for the data signal (Eq. 12, 13) which is analogous to the limitation of the reference signal multiplied by a weighting factor of .5 and no weighting (an effective weighting of 1) for the data signals.

Claim 16, Ling discloses a receiving portion (fig. 1, 122) of a communication system receives a transmitted signal over the communication channel (fig. 1, 120) through an antenna (fig. 1, 124). This received signal is sampled by despreader and sampler (fig. 1, 126, col. 7, lines 55-60). The stream of samples (fig. 1, 144) is input to a power estimator (fig. 1, 146) so that an estimate (fig. 1, 148) of the power of the received communication signal as a function of the stream of samples is generated. (col. 10, lines 4-7) This power estimation method, shown in fig. 5, forms a sum (fig. 5, 258) of s_s and the square value of S_{ref} (which are performed by elements 228-240 for S_{ref} and elements 244-256 for s_s). Both values 240 and 256 are weighted as a linear combination before forming the sum (fig. 1, 258). The magnitude (fig. 5, 260) of the

sum (fig. 5, 258) is used as the power estimate (fig. 1, 148, col. 13, lines 45-55). This power control indicator (fig. 1, 171) is prepared for transmission and transmitted through an antenna (fig. 1, 174) over the communication channel (fig. 1, 120) by a modulator (fig. 1, 170). This power control indicator is received by another communication unit over the communication channel (fig. 1, 120) by antenna (fig. 1, 176). The communication unit may adjust a particular signal transmission power of the signal transmitter (fig. 1, 116) in response to the detected power control indicator (fig. 1, 180, col. 10, lines 15-37). Ling fails to disclose accumulating reference symbols, however, as Ling does discloses accumulating reference symbols. Ling uses these reference symbols for estimating and controlling the power of a received symbol. Because reference symbols and reference symbols serve a similar purpose, it would be obvious to one skilled in the art at the time of invention to use reference symbols as reference symbols in Ling's teaching.

Claim 19, Ling discloses an apparatus for comprising a receiver (fig. 1, 124) that receives a wireless signal, a demodulator (fig. 1, 126) that demodulates individual chips of the wireless signal, a symbol generator that groups results of the demodulation into a stream of samples (fig. 1, 144) which is input into the power estimator (fig. 1, 146, fig. 5) so that an estimate (fig. 1, 148) of the power of the received communication signal as a function of the stream of samples can be generated (col. 10, lines 4-8). The power estimator (fig. 1, 146, fig. 5) calculates an estimate of the power of the wireless signal by separately accumulating both reference symbols (fig. 5, 228, 232) and the data

symbols (fig. 5, 144, 248) and calculating a weighted sum (fig. 5, 236, 238, 252, 254, 242) of the accumulated reference and data symbols (col. 13, lines 45-55). Ling fails to disclose accumulating reference symbols, however, as Ling does discloses accumulating reference symbols. Ling uses these reference symbols for estimating and controlling the power of a received symbol. Because reference symbols and reference symbols serve a similar purpose, it would be obvious to one skilled in the art at the time of invention to use reference symbols as reference symbols in Ling's teaching.

Claim 24, inherits the limitations of Claim 19. Ling further discloses the apparatus forms part of a wireless communication device in a wireless communication system (col. 14, lines 31-35).

Claim 27, Ling discloses a wireless communication system comprising a wireless communication device that sends a first signal encoded with reference and data symbols (fig. 1, 100, 116, 118, 176, 178) and a base station that receives the first signal (124) and estimates power (fig. 1, 146) of the first signal by separately accumulating the reference symbols (fig. 5, 228, 232) and the data symbols (fig. 5, 144, 248) and calculating a weighted sum (fig. 5, 236, 238, 252, 254, 242) of the accumulated reference and data symbols (col. 13, lines 45-55).

Claim 28, inherits the limitations of Claim 27. Ling further discloses the base station compares (fig. 1, 169) the estimated power (146) of the first signal to a target value and sends a second signal back to the wireless communication device (fig. 1, 171, 170, 174,

176) to adjust transmit power of the wireless communication device accordingly (col. 10, lines 11-17, 34-37).

Claim 29, Ling discloses a wireless communication system (fig. 1, col. 14, lines 31-35) with a base station that sends a first signal encoded (fig. 1, 104) with reference (fig. 1, 112) and data symbols (fig. 1, 102) and a wireless communication device that receives the first signal (fig. 1, 124) and estimates power (fig. 1, 146) of the first signal by separately accumulating the reference symbols (fig. 5, 228, 232) and the data symbols (fig. 5, 244, 246) and calculating a weighted sum (fig. 5, 236, 238, 252, 254, 242) of the accumulated reference and data symbols.

Claim 30, inherits the limitations of Claim 29. Ling further discloses the device receiving the first signal compares the estimated power of the first signal (fig. 1, 148) to a target value (fig. 1, 169) and sends a second signal back to the base station (fig. 1, 171, 170, 174) to adjust transmit power of the base station accordingly (col. 10, lines 11-17, 34-37).

3. Claims 17, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ling and in further view of Ionescu.

Claim 17, Ling discloses accumulating reference symbols of a first wireless signal (fig. 5, 244, 246, 248, 250) and accumulating data symbols of the first wireless signal (fig. 5,

228, 230, 232, 234) and calculating a sum (fig. 5, 242) of the weighted accumulated reference symbols (fig. 5, 254) and the weighted accumulated data symbols (fig. 5, 236) to estimate power of the first wireless signal (col. 13, lines 45-55). Ling fails to disclose a computer-readable medium carrying program code that when executed performs this function. However, Ionescu discloses a receiving and transmitting apparatus that controls the transmission power (abstract) which can be executed on a computer-readable medium carrying program code which executes these functions (col. 10, lines 35-45).

Claim 18, inherits the limitations of Claim 17. Ling further discloses shown in fig. 5, forms a sum (fig. 5, 258) of s_s and the square value of S_{ref} (which are performed by elements 228-240 for S_{ref} and elements 244-256 for s_s). Both values 240 and 256 are weighted as a linear combination before forming the sum (fig. 1, 258). The magnitude (fig. 5, 260) of the sum (fig. 5, 258) is used as the power estimate (fig. 1, 148, col. 13, lines 45-55).

4. Claims 13-15, 20-23, 25, 26 are objected to as dependent upon a rejected claim, but if rewritten in independent form would be allowable in view of the known prior art.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin M. File whose telephone number is (571)272-6040. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Erin M. File

EMF

2/4/2005

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600